modified into a composition where a metal film is deposited on a semiconductor surface or an insulator film is deposited on a metal surface. There is another modification where a semiconductor film is deposited on an underlying semiconductor of dissimilar material. Anyway, reduction of interfacial defects or the interfacial level density is the general demand. Therefore, the invention satisfying this demand has great significance.

In the composition of the invention, the thin film deposition after the pre-treatment may be carried out by a method other than CAT-CVD. PECVD or other thermal CVD may be employed in case that damage by plasma makes no problem or higher deposition temperature is allowed.

The thermal catalysis body in the invention may be made of molybdenum, tantalum, titanium or vanadium other than tungsten. In studies by the inventors, the thermally catalytic effects with these materials were confirmed. Any shapes of the thermal catalysis body such as a spiral, swirl or mesh may be employed other than the saw-tooth-wave. A blade- or rod-shaped thermal catalysis body also may be used other than using a wire. A treatment such as electrolytic polishing is given on the surface of the thermal catalysis body if necessary. When the thermal catalysis body is used at temperatures over 1500℃ introducing a silicon compound gas such as silane, silicide is occasionally formed on the surface of the thermal catalysis body. In this case, the thermal catalysis body is preferably replaced with a new one or one having a clean surface.

Describing the terminology of "via thermal catalysis body", that does not always mean a gas molecular contacts physically on the surface of the thermal catalysis body. This is because the inventors would not deny the possibility that the catalytic reaction can occur without any physical contact on the thermal catalysis body. In other word, the catalytic reaction may occur even if a gas molecular gets close to the surface of the thermal catalysis body.

WHAT IS CLAIMED IS:

1. Method for depositing a thin film on a substrate surface of material dissimilar to said thin film, comprising steps of; carrying out a treatment for reducing interfacial defects between said substrate surface and said thin film by a catalytic reaction of a treatment gas which is supplied with said substrate via a thermal catalysis body provided near said substrate surface, and depositing said thin film on said surface after said treatment.

2. Method for depositing a thin film on a substrate surface as claimed in claim 1, wherein said deposition is carried out by another catalytic reaction of a deposition gas which is supplied with said substrate surface via said thermal catalysis body.

3. Method for depositing a thin film on a substrate surface as claimed in claim 1, wherein said material of said substrate surface is semiconductor and said thin film is insulator.

4. Method for depositing a thin film on a substrate surface as claimed in claim 3, wherein said material of substrate surface is Si, Ge, SiGe, SiC, GaAs, GaAlAs, GaP, InP, ZnSe or CdS.

5. Method for depositing a thin film on a substrate surface as claimed in claim 3, wherein said thin film is silicon oxide film, silicon nitride film, silicon oxygen nitride film, aluminum nitride film or aluminum oxide film.

6. Method for depositing a thin film on a substrate surface as claimed in claim 1, wherein said material of said substrate surface is semiconductor of gallium arsenide series, said treatment gas is nitrogen bearing gas or hydrogen gas, and said treatment is surface cleaning or surface denaturalizing.

7. Method for depositing a thin film on a substrate surface as claimed in claim 6, wherein temperature of said substrate is kept below 400℃.

8. Method for depositing a thin film on a substrate surface as claimed in claim 1, wherein temperature of said substrate is kept lower than temperatures at which said substrate is thermally degraded.

9. Method for depositing a thin film on a substrate surface as claimed in claim 1, wherein said thermal catalysis body is made of tungsten, molybdenum, tantalum, titanium or vanadium.

10. Apparatus for depositing a thin film on a substrate surface, comprising; a process chamber in which said substrate is placed, a thermal catalysis body provided near said substrate placement, a heater for heating said thermal catalysis body up to an temperature, deposition gas introduction system for introducing a deposition gas into said process chamber and treatment gas introduction system introducing a treatment gas, wherein said thin film is deposited on said substrate surface utilizing reaction of said deposition gas supplied with said substrate surface via said thermal catalysis body and a treatment for reducing interfacial defects between said substrate surface and said thin film is carried out by supplying said treatment gas with said substrate via said thermal catalysis body in said chamber before said thin film deposition.

11. Apparatus for depositing a thin film on a substrate surface as claimed in claim 10, wherein material of said substrate surface is semiconductor and said thin film is insulator.

12. Apparatus for depositing a thin film on a substrate surface as claimed in claim 11, wherein material of said substrate surface is Si, Ge, SiGe, SiC, GaAs, GaAlAs, GaP, InP, ZnSe or CdS.

13. Apparatus for depositing a thin film on a substrate surface as claimed in claim 10, wherein said thin film is silicon oxide film, silicon nitride film, silicon oxygen nitride film, aluminum nitride film or aluminum oxide film.

14. Apparatus for depositing a thin film on a substrate surface as claimed in claim 10, wherein said material of said substrate surface is semiconductor of GaAs series, said treatment gas is a nitrogen bearing gas or hydrogen gas, and said treatment is surface cleaning or surface denaturalizing utilizing radicals decomposed from said treatment gas by said thermal catalysis body.

15. Apparatus for depositing a thin film on a substrate surface as claimed in claim 14, wherein said heater heats said thermal catalysis body as far as that temperature of said substrate is kept below 400℃.

16. Apparatus for depositing a thin film on a substrate surface as claimed in claim 10, wherein said substrate has a wiring for an integrated circuit and said heater heats said thermal catalysis body as far as said temperature of said substrate does not exceed the melting point of said wiring.

17. Apparatus for depositing a thin film on a substrate surface as claimed in claim 10. wherein said thermal catalysis body is made of tungsten. molybdenum. tantalum, titanium or vanadium.

18. Semiconductor device having a semiconductor-insulator junction obtained by depositing an insulator film on an underlying semiconductor surface, wherein the interfacial level density of said semiconductor-insulator junction is 10^{12} $eV^{-1}cm^{-2}$ or less as a result that said insulator film is deposited on said underlying semiconductor surface after a treatment that reduces interfacial defects on said semiconductor-insulator junction utilizing a reaction of a treatment gas supplied with a substrate having said underlying semiconductor via a thermal catalysis body provided near said substrate.